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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/841,096   | 04/25/2001  | Yoshihiro Sasaki     | 01USFP616-R.M.      | 4973             |
| 466  | 7590        | 05/03/2004           | EXAMINER            |                  |
| YOUNG & THOMPSON<br>745 SOUTH 23RD STREET 2ND FLOOR<br>ARLINGTON, VA 22202 |             |                      | STREGE, JOHN B      |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2625                | 4                |

DATE MAILED: 05/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/841,096             | SASAKI ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | John B Strege          | 2625                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 25 April 2001.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-16 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1,2,6,8-10,14 and 16 is/are rejected.  
 7) Claim(s) 3-5,7,11-13 and 15 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 25 April 2001 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 2.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Examiner suggests – Appearance Inspection using parallel processing

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by

Shimizu et al. USPN 5,936,224 (hereinafter “Shimizu”).

Claim 1 discloses, an appearance inspection apparatus comprising: a memory which stores image data of an appearance of an inspection target; a thread generator which generates a plurality of threads in each of which a procedure is described for independently processing the image data stored in said memory and storing a processing result into said memory; and a plurality of CPUs which executes said plurality of threads generated by said thread generator in parallel, respectively.

Shimizu discloses a machine vision system (col. 3 line 57) with an image sampling or capturing device 12 (figures 1 and 2) for inspecting the appearance of data

collection symbols or other machine-readable images (col. 3 lines 57-67). A central processing unit receives the video data signals output from the area image and stored into a memory 16 coupled to the CPU (col. 4 lines 47-54). Further disclosures are multiple processors (14' figure 2) where each of the CPUs 14' can be dedicated to a particular reading method, or various modules or tasks can be divided among the CPUs based on their availability (col. 5 lines 1-3). The memory 16 includes for processing efficiency an array of memory locations addressed by the CPU 14 that correspond to and represent the pixels in the field of view of the CCD array (col. 5-6 lines 66-67 and 1-2). The CPU 14 (read as the thread generator) performs multiple threads through selected combinations of modules where each thread performs an overall reading method that is directed to a particular problem (col. 11 lines 31-42). As can be seen in figure 2, the multiple CPU's are connected to the memory. Furthermore Shimizu discloses that the routine 100 shown in figure 3, and all the routines and methods described, are permanently stored within the non-volatile memory portion of the memory 16 (col. 5 lines 15-19). It should be noted that Shimizu recites that the routine 300 assigns a particular thread or path through each set of modules dynamically (thus generating threads), or based on a prior knowledge that can be derived (col. 11 lines 13-14).

Claim 9 is similar to claim 1, except claim 9 is a method claim. Thus the same arguments used for claim 1 apply equally to claim 9.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 8, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of the publication of the proceeding in Visualization 1999 by Law et al. *A multi-threaded streaming pipeline architecture for structured data sets* (hereinafter "Law").

Shimizu discloses all of the limitations of claim 1, and discloses processing using multiple CPU's (as seen in figure 2).

Shimizu does not disclose expressly dividing the inspection region into n subregions or generating sets of threads for each subregion.

Law discloses that the size of data is becoming so large that conventional visualization tools are incapable of processing it (as stated in the abstract, page 225). To remedy this problem Law proposes breaking data into pieces, and then processing each piece separately, or distributing each piece across a network for parallel processing (first paragraph, section 2, page 226). Law further discloses that the pieces can be broken into further sub-pieces for the purpose of multi-threading, each processor taking one sub-piece (first paragraph, section 3, pages 227-228). Here the pieces can be read as sets, and each piece is made up of subpieces where each subpiece has a

thread to a processor, thus generating  $k$  sets of  $n$  threads, and dividing the image into  $n$  subpieces. Law further discloses that while the architecture described in the paper supports a local multi-processor, shared memory approach, it is readily extensible to the distributed environment. In the distribute environment, data can be broken into pieces and assigned to systems across the network, thus providing for the limitation of the plurality of CPU's (third paragraph, section 5, page 232).

Shimizu & Law are combinable because they are from the same field of endeavor of parallel processing and multi-threading.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Shimizu and Law to split the image obtain by Shimizu into multiple sets of sections, and sending a thread out for each subpiece.

The suggestion/motivation for doing so would have been to account for large pieces of image data.

Therefore, it would have been obvious to combine Shimizu with Law to obtain the invention as specified in claim 2.

Claim 8 discloses similar limitations to claim 2, however claim 8 is broader since it does not include all of the limitations. Therefore the arguments used for the rejection of claim 2 apply equally to the rejection of claim 8.

Claim 10 is similar to claim 2 except claim 10 is a method claim, thus the same arguments used for claim 2 apply equally to claim 10.

Claim 16 is similar to claim 8 except claim 16 is a method claim, thus the same arguments used for claim 8 apply equally to claim 16.

6. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Law and further in view of JP-A-Heisei, 11-135054.

The combination of Shimizu and Lee discloses the limitations of claim 2.

Shimizu nor Law does not disclose expressly that the thread executes a predetermined kind of image processing and another kind of image processing in succession.

In the applicants description of related art it is disclosed that the system in JP-A-Heisei, 11-135054 uses parallel processing to execute not only a basic image processing but also image processing requiring an advanced calculation at a high speed.

Shimizu, Law, and JP-A-Heisei, 11-135054 are combinable because they are from the same field of endeavor of parallel processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to describe procedures in the threads for multiple types of image processing.

The suggestion/motivation for doing so would have been to carry out advanced calculations or magnifications within an inspection system when necessary.

Therefore, it would have been obvious to combine Shimizu with Law and JP-A-Heisei, 11-135054 to obtain the invention as specified in claim 6.

Claim 14 is similar to claim 6 except claim 14 is a method claim. Thus the same arguments used for claim 6 apply equally to claim 14.

***Allowable Subject Matter***

7. Claims 3-5, 7, 11-13, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Woods et al. USPN 6,594,590

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B Strege whose telephone number is (703) 305-8679. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS



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